

ANNUAL WATER QUALITY REPORT

WATER TESTING PERFORMED IN 2017



Presented By
City of Keene

PWS ID#: 1241010

There When You Need Us

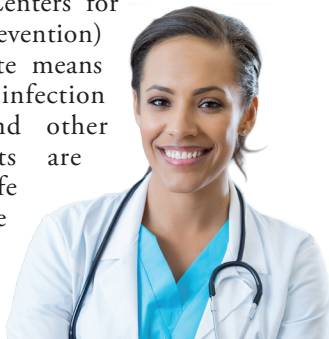
Once again the City of Keene is proud to present its annual water quality report, covering all testing performed between January 1 and December 31, 2017. The Public Works Operations, Laboratory, Maintenance, and Water/Sewer divisions have dedicated themselves to producing and delivering high-quality drinking water that meets all state and federal standards. As new challenges to drinking water safety emerge, the City remains vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all users 24 hours a day, 7 days a week.

Community Participation

The City Council's Municipal Services, Facilities, and Infrastructure committee is designated to address water-related issues. This committee holds regular meetings at 6:00 p.m. on the 2nd and 4th Wednesdays of each month in the City Council Chambers at City Hall. If you wish to speak with them about an issue concerning your drinking water, contact the City of Keene Clerk's office at (603) 352-0133.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.



Where Does My Water Come From?

The City of Keene delivers both surface water and groundwater to its customers. The majority of the water comes from the surface water reservoirs located in the town of Roxbury and some from four gravel-packed wells located in Keene on Court and West Streets. Water from the reservoir flows to the Water Treatment Facility (WTF), where it is filtered, disinfected, and made less acidic before it enters the distribution system. Well water is pumped from the Court Street and West Street aquifers. It is not filtered but it is disinfected and made less acidic before it is distributed to your home. Although your water comes from more than one source, it all goes into the same distribution system, so you may receive different blends of water on different days.

What's a Cross-Connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (backpressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (backsiphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure that they provide maximum protection.

For more information on backflow prevention, call the Safe Drinking Water Hotline at (800) 426-4791.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Source Water Assessment

In October 2002, the NH Department of Environmental Services prepared Source Water Assessment Reports for our source waters, assessing the sources' vulnerability to contamination. The results of the assessments are as follows:

- Babbidge Reservoir received zero high-susceptibility ratings, one medium-susceptibility rating, and eleven low-susceptibility ratings.
- The Court Street well field received two high-susceptibility ratings, five medium-susceptibility ratings, and five low-susceptibility ratings.
- The West Street well site received six high-susceptibility ratings, three medium-susceptibility ratings, and three low-susceptibility ratings.

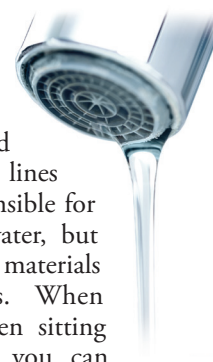
Water treatment is a complex, time-consuming process.

The complete Assessment Report is available for review at the Keene Public Works Department. For more information, contact Donna Hanscom, Assistant Public Works Director at 352-6550 or visit the NH Department of Environmental Services Drinking Water Source Water Assessment Program Web site at <https://www.des.nh.gov/organization/divisions/water/dwgb/dwspp/dwsap.htm>.



Lead in Home Plumbing

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water, but we cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on



lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/lead.

QUESTIONS?

The City encourages and welcomes participation and feedback from the public. Come see how the Water Treatment Facility works: City staff invites individuals, groups, schools, and college classes to schedule a tour of the facility.

For more information about this report, to schedule a tour, or for any questions relating to your drinking water, please call Aaron Costa, Operations Manager, at (603) 357-9836, Ext: 6507, acosta@ci.keene.nh.us, or Benjamin Crowder, Water Treatment Facility Manager, at (603) 357-8483 or bcrowder@ci.keene.nh.us.

Upcoming Improvements to Keene's Water System



380,000 Gallon Black Brook Water Storage Tank

In 2015 a routine inspection showed deterioration of the interior walls of the tank most likely caused by the movement of ice that forms inside the tank during the winter. Previously, in 2011 the City installed a solar powered tank mixer to prevent water stratification and ice formation. In 2018 the tank will be taken out of service for a period of 3 to 4 weeks so that necessary repairs can be made. The repairs include a crack sealing and a new interior and exterior coating system. Total cost of repairs \$95,355.



Babbidge Dam Improvements will be Complete This Summer

The 1931 era earthen dam holds approximately 150 million gallons of water and serves as the City's main water supply. Upgrades to the dam include:

- Armoring of the dam face to increase structural integrity
- New gates and discharge piping for improved flow regulation
- Total cost of improvements \$1,640,000



3.0 Million Gallon Tank Evaluation

The 3.0 MG tank located on upper Roxbury Road is a welded steel tank that was built in 1962. This tank is a critical piece of infrastructure for fire suppression and the delivery of high quality water for daily residential, commercial and industrial use. In 2013 the exterior of the tank was inspected by a professional engineering firm and in 2015 the interior of the tank was inspected by a team of specialized divers, both noted several deficiencies. The evaluation will determine whether it is more economical to construct a new tank or perform the necessary repairs and refurbish the existing tank.

Sampling Results

During the past year, staff collected hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The tables below show only those contaminants that were detected in the water. The state requires the City to monitor for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken

The City participated in the 3rd stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR3) program by performing additional drinking water tests. UCMR3 benefits the environment and public health by providing the EPA with data on the occurrence of contaminants suspected to be in drinking water. This information is used by the EPA to help determine if new regulatory standards to improve drinking water quality are needed. Please contact Mary Ley, Laboratory Supervisor, at (603) 357-9836, Ext. 6502, for more information on this program.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chlorine (ppm)	2017	[4]	[4]	0.78	0.08–1.24	No	Water additive used to control microbes
Haloacetic Acids [HAAs] (ppb)	2017	60	NA	28.6	9.4–49.5	No	By-product of drinking water disinfection
Nitrate (ppm)	2017	10	10	0.88	0.3–1.7	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2017	80	NA	48.2	5.1–69.1	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2017	TT	NA	1.05	0.5–1.6	No	Naturally present in the environment
Turbidity¹ (NTU)	2017	TT	NA	0.56	0.02–0.56	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2017	TT = 95% of samples meet the limit	NA	99.7	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community.

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2017	1.3	1.3	0.32	0/69	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2017	15	0	2	2/69	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Aluminum (ppb)	2017	200	NA	46	NA	No	Erosion of natural deposits; Residual from some surface water treatment processes
Chloride (ppm)	2017	250	NA	33.2	6.8–63	No	Runoff/leaching from natural deposits
Copper (ppm)	2017	1.0	NA	0.036	NA	No	Corrosion of household plumbing systems; Erosion of natural deposits
Iron (ppb)	2017	300	NA	92	53–170	No	Leaching from natural deposits; Industrial wastes
Sulfate (ppm)	2017	250	NA	10.7	3.9–15	No	Runoff/leaching from natural deposits; Industrial wastes
Zinc (ppm)	2017	5	NA	0.04	NA	No	Runoff/leaching from natural deposits; Industrial wastes

UNREGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Bromodichloromethane (ppm)	2017	2.3	NA	By-product of drinking water disinfection
Chloroform (ppm)	2017	30.4	NA	By-product of drinking water disinfection
Sodium (ppm)	2017	37	17–60	Naturally occurring

¹Turbidity is a measure of the cloudiness of the water. It is monitored by surface water systems because it is a good indicator of water quality and thus helps measure the effectiveness of the treatment process. High turbidity can hinder the effectiveness of disinfectants.

Definitions

AL (Action Level): The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

LRAA (Locational Running Annual Average): The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as the highest LRAAs.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

SMCL (Secondary Maximum Contaminant Level): SMCLs are established to regulate the aesthetics of drinking water like appearance, taste and odor.

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.